19. (a) Discuss the fate of an excited state, molecule with the support of Jablonskii diagram. (5)

(b) Describe the Woodward-Hoffmann rule for electrocyclic reactions. (5)

20. (a) Describe a method of synthesizing anthocyanins. (5)

(b) How to synthesis vitamin Al using the Witting and Reformatsky method? (5)

APRIL/MAY 2023

DCH31 — ORGANIC CHEMISTRY – III

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Differentiate the types of electronic transitions.
2. How is aromatic and aliphatic ester differentiated using IR spectroscopy?
3. Define Larmour frequency.
4. What is mean by chemical shift?
5. How to identify the homolytic and heterolytic cleavage in mass spectroscopy?
6. Mention any two applications of ORD.
7. Draw the structure of bullvalene.
8. What are fluxional molecules? Give an example.
9. Give the chemical structure of flavones.
10. How to synthesise thiazole moiety?

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions.

11. (a) Discuss the importance of Woodward-Fieser rules in UV-vis spectroscopy.

Or

(b) Write a brief note on the identification inter and intramolecular hydrogen bonding vsing IR spectroscopy.

12. (a) Discuss the magnetic anisotropy in aromatic molecules using NMR spectroscopy.

Or

(b) Describe the importance of proton decoupling in NMR.

13. (a) Discuss the McLafferty rearrangement in mass spectroscopy.

Or

(b) State and explain the applications of axial haloketone rule.

14. (a) Discuss Norrish Type I and Type II reactions with examples.

Or

(b) Prove that $[4\pi + 2\pi]$ cycloaddition is thermally allowed reaction.

15. (a) Mention two synthetic methods for the synthesis of flavone derivatives.

Or

(b) Describe the conversion of cholesterol into testosterone.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. (a) How can we distinguish various types of carbonyl compounds using IR spectroscopy? (5)

(b) Explain chromophores and auxochromes with suitable examples. (5)

17. (a) Sketch and explain the ^1H NMR spectra of CH_3CH_2Cl and CH_3CHO. (5)

(b) Write a short note on geminal and vicinal coupling. (5)

18. (a) Discuss the factors affecting the fragmentation pattern in mass spectra. (5)

(b) Explain the applications of ORD in the determination of chirality of molecules. (5)